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Five hundred and thirtieth Meeting.

January 27, 1864.—STATUTE MEETING.

The PRESIDENT in the chair.

On motion of Dr. B. A. Gould, it was voted that a committee be appointed to consider the expediency of expunging the words "hereafter elected" in Chapter IX., Section 2, of the Statutes of the Academy, and to consider whether any other, and, if any, what changes in the Statutes are desirable. Messrs. J. A. Lowell, Parsons, Sparks, Winthrop, and B. A. Gould were appointed to serve on this committee.

The following gentlemen were elected members of the Academy:—

Mr. Ralph Waldo Emerson, to be a Resident Fellow in Class III., Section 4.

Mr. Richard H. Dana, Jr., to be a Resident Fellow in Class III., Section 1.

Professor J. P. Lesley of Philadelphia, to be an Associate Fellow in Class II., Section 1.

Professor Wyman presented a Memoir "On the Development of *Raia Batis*."

Five hundred and thirty-first Meeting.

February 9, 1864.—ADJOURNED STATUTE MEETING.

The PRESIDENT in the chair.

Professor Lovering, from the Rumford Committee, presented the following Report.

"The Academy having voted (June 1, 1862), that six hundred dollars be paid to Philander Shaw, to be expended by him in experiments or investigations relative to air-engines, the Rumford Committee have considered themselves under obligation to watch the progress of these and similar experiments, &c., and occasionally to report upon them to the Academy.

"The Committee have examined all the air-engines in Boston that they have been able to find after diligent inquiry, and they believe that they have obtained as much and as accurate information in regard to them as could be had; and as much as seemed, in the present state of the question, useful.

"They find three kinds of engines in practical operation: 1st, Mr. Ericsson's, to which the Rumford medal was awarded by the Academy at the adjourned annual meeting in June, 1862; 2d, Mr. Shaw's; and 3d, Mr. Roper's. Engines by these inventors were at work in Boston or its vicinity at the time of that award, and were described in the discussions which were had on the Report of the Rumford Committee at that time. The Ericsson engines which were then at work in Boston are still at work; but the Committee have not been able to find that another of this kind has been added to the number; and they believe that no addition has been made.

"All measurements of these engines have shown that their *nominal* power greatly exceeds their actual useful effect. The Committee have found, in every one measured, the actual power to be only from one eighth to one seventh of that for which the engine was purchased.

"The first one submitted to the Rumford Committee of the preceding year (estimated at one horse-power) measured only one seventh of one horse-power. Two other four-horse engines each measured from two thirds to three fourths of one horse-power; and the two-horse engine at the office of the 'Medical Journal' measured only one fourth of one horse-power. These engines consume about fourteen pounds of coal to the horse-power per hour. These measures were taken as the machines were found at their ordinary work, and are believed to express with sufficient accuracy their performance under ordinary circumstances.

"The engines of Mr. Shaw and Mr. Roper, while they differ from each other in some important particulars, are similar in the points to which the former Rumford Committee attached most value. They both work under pressure, and heat the air by passing it directly through the flame, without the intervention of any conducting substance. They are also independent of the draught of a chimney, and are as effective in the attic as in the basement of a building; moreover, they are almost, if not quite, as steady and as noiseless as a steam-engine.

"Mr. Shaw, during the past year, has been engaged in experiment-

ing upon his engine, chiefly with a view to secure as great economy in fuel as possible. He has sold several engines, however, which seem to have given satisfaction, and has now several others nearly completed. He has increased the power of his engine considerably by adding a small tubular boiler, in which steam is generated by the heat of the exhaust air. This boiler communicates with his reservoir of condensed air, and increases and equalizes the pressure. The Committee have found his estimates of the power of his engines correct. Those from two to three horse-power consume about $2\frac{1}{2}$ pounds of coal to the horse-power per hour. None of his engines have been in operation long enough, however, to put their practical success beyond question, although one of them has now been in constant use for four months, giving satisfaction to its owner. The Committee believe that Mr. Shaw has, or will have, after a few changes, a successful engine.

"Mr. Roper's experiments have been directed rather to improvements in other respects than to securing economy in fuel. His engine has been greatly improved since the last report of the Rumford Committee. Mr. Roper has finally settled on the form which he will retain, and has begun to manufacture engines from it on a large scale. The ease with which this engine can be repaired, and the facilities which its construction afford for its manufacture *in great numbers*, will probably lead to its very general use. It consumes not more than five pounds of coal to the horse-power per hour. The Committee believe this to be the most successful hot-air engine now at work in Boston. The largest size made, up to this time, is two-horse-power."

Dr. B. A. Gould presented a report from the committee appointed to consider the intent of the statutes concerning the election of Fellows. The report was accepted, and a recommendation to modify the statute, Chapter IX., Section 2, by substituting the words "at least ten weeks," for the words "the interval between two stated meetings," was referred to the Committee on amending the Statutes.

Dr. B. A. Gould was excused from serving on the committee, and the President was appointed in his place.

The following gentlemen were elected members of the Academy, viz.: —

To be Foreign Honorary Members:—

Henry H. Milman, the Dean of St. Paul's, London, in Class III., Section 3, in place of Archbishop Whately, deceased.
Professor Max Müller of Oxford, in Class III., Section 2, in place of Jacob Grimm, deceased.

Frederick Overbeck of Rome, in Class III., Section 4, in place of the late Christian Rauch.

Professor Thomas Graham, Master of the Mint, London, in Class I., Section 3, in place of Professor Mitscherlich.

To be Associate Fellows:—

Major-General George G. Meade, U. S. A., in Class I., Section 4.
Professor Ogden N. Rood of New York, in Class I., Section 3.

To be Resident Fellows:—

Mr. Edward Pearce and Dr. William Watson of Cambridge, both in Class I., Section 1.

Dr. H. R. Storer called attention to a matter that might be considered as of general interest, the result of investigations he had for some years been making into *the causation of insanity among women*. From the facilities of observation afforded him by a large special practice, and more lately by his position as one of the State Commissioners on Insanity, he had been irresistibly led to certain conclusions that were apparently of scientific and practical value. They were not at variance with what had previously been enunciated upon the subject, but they promised to open a new and fruitful field for explanation and curative treatment. He proposed the following as general laws:—

“1. In women of insane tendency, accidental or by inheritance, the access of insanity, its increase and its results, are more likely to occur at times of uterine or ovarian excitement, whether periodical and normal, or from disease.

“2. In women, mental derangement, even of extreme character, is very commonly, indeed almost constantly, the consequence of uterine or ovarian derangement, however trifling; occurring at puberty, at the grand climacteric, or at any point between them, during virginity, during gestation, during or after labor, or during lactation, from excessive sexual gratification, or excessive sexual abstinence, from self-abuse, from organic or functional local lesion.

"3. So large a proportion of the mental derangements of women being sympathetic and reflex, and referable to local derangements, herein differing from what obtains in men, where insanity is more frequently of centric and cerebral origin, there is decided indication for local curative treatment much oftener than it is now resorted to in cases of insane women, either at asylums or in private practice."

Dr. Storer presented various evidence corroboratory of his views, and related an illustrative case. He also alluded to a peculiar sensational torpor of the insane as explanatory of the otherwise unaccountable fact that severe physical lesions, as fracture of ribs, &c., are not unfrequently discovered at post-mortem examinations of the insane, of which no complaint or suspicion had existed during life. From this he drew another deduction of practical importance in the administration of criminal law.

"4. In medico-legal investigations, whether they are coroner's inquests, trials for homicide, or for the abuse of insane patients in confinement, it must not be forgotten that the insane, so far as regards matters of sensation, whether as to effects from wounds or from acute or chronic disease, are not to be judged by the ordinary physiological laws."

Five hundred and thirty-second Meeting.

March 8, 1864. — MONTHLY MEETING.

The PRESIDENT in the chair.

The President called the attention of the Academy to the recent decease of three of its members; viz. Professor Edward Hitchcock of the Resident Fellows, and Baron Plana and Heinrich Rose of the Foreign Honorary Members.

The following papers were presented.

On the Right Ascension of the Pole Star, as determined from Observation. By TRUMAN HENRY SAFFORD, Assistant at the Observatory of Harvard College.

1. The fixed star α Ursæ Minoris, the Pole-Star, has been the object of very numerous observations,—more indeed than any other cele-